

Patent claims

1. An electronic module having a first (1, 2, 3) and a second (4, 5, 6) component with connections (7) on connection sides (8) of the components (1-6), a wiring block (9) with contact pads on its outer sides (11-14) and with lines (15) in its volume (16), the lines (15) electrically connecting the contact pads (10) on the outer sides (11-14) to one another according to a circuit layout (17) and the two components (1-6) being arranged on different non-opposite outer sides (11, 12, 13, 14) of the wiring block (9) and their connections (7) being connected to the contact pads (10).
- 15 2. The electronic module according to claim 1, characterized in that the lines (15) comprise carbonized plastic.
- 20 3. The electronic module according to claim 1 or claim 2, characterized in that the lines (15) comprise nanoparticles with carbonized short-circuit paths between the nanoparticles.
- 25 4. The electronic module according to claim 1 or claim 3, characterized in that the lines (15) comprise anisotropically oriented nanoparticles.
- 30 5. A device for producing an electronic module, having the following features:
 - a casting mold (18) for the introduction of plastic (19),
 - 35 - two focusable energy sources (20, 21) with an orienting device (22, 23) for guiding and superposing the focus regions (24) of the energy sources (20, 21) for forming lines (15) of the

wiring block (9) to be produced in the volume of the plastic (19) to be introduced

- at least one casting device for the continuous or layer-by-layer filling of the casting mold (18) with plastic (19) with the formation of lines (15) in the envisaged volume (16) of the wiring block (9).

5 6. The device according to claim 5,
10 characterized in that
the focusable energy sources (20, 21) are laser apparatuses.

15 7. The device according to one of claims 4 to 6,
characterized in that
the device comprises a microprocessor for controlling
the energy sources (20, 21).

20 8. A method for producing an electronic module (25)
having two components (1-6) on different outer sides
(11-14) of the wiring block (9), the wiring block (9)
comprising electrical contact pads (10), the method
comprising the following method steps:

- introduction of plastic (19) into a casting mold (18) for the production of a plastic blank block (26),
- partial carbonization of the plastic (19) and/or partial agglomeration of nanoparticles in the plastic blank block (26) to form lines (15) of a wiring block (9) according to a predetermined circuit layout (17) by means of radiating in energy of two focused and guided energy beams (27, 28) from energy sources (20, 21),
- removal of the wiring block (9) from the casting mold (18),
- application of contact pads (10) at piercing points (29) of the lines (15) on the outer sides (11-14),

- application of two components (1-6) with their connections (7) on different and non-opposite outer sides (11-14) of the wiring block.

- 5 9. The method according to claim 8,
characterized in that
firstly at least one plastic layer with lines (15) is
produced and afterward further plastic layers arranged
on the first layer are realized, lines (15) being
10 produced within the layers and from layer to layer by
carbonization of the plastic (19) and/or by
agglomeration of nanoparticles in the respective
plastic layer.
- 15 10. The method according to one of claims 8 to 11,
characterized in that
the introduction of energy for forming lines (15) is
effected by means of microwave excitation or by means
of electromagnetic radiation or by means of ultrasonic
20 radiation.